

## Service Manual



PCB Separator

# MAESTRO 4S

MADE IN GERMANY

## 2 Service Manual

### for the following products

Description	Type
PCB Separator	MAESTRO 4S

**Edition:** 12/2019 **Art.-Nr.:** 9009826

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## 1 Introduction

### 1.1 Instructions

Important information and instructions in this documentation are designated as follows:



#### **Danger!**

**Draws your attention to an exceptionally grave, impending danger to your health or life.**



#### **Warning!**

**Indicates a hazardous situation that could lead to injuries or material damage.**



#### **Attention!**

**Draws attention to possible dangers, material damage or loss of quality.**



#### **Notice!**

**Gives you tips. They make a working sequence easier or draw attention to important working processes.**



#### **Environment!**

Gives you tips on protecting the environment.



Handling instruction



Reference to section, position, illustration number or document.



Option (accessories, peripheral equipment, special fittings).



#### **Video**

Reference to a video on the website to this topic.

### 1.2 Intended Use

- The device is manufactured in accordance with the current technological status and the recognized safety rules. However, danger to the life and limb of the user or third parties and/or damage to the device and other tangible assets can arise during use.
- The device may only be used for its intended purpose and if it is in perfect working order, and it must be used with regard to safety and dangers as stated in the operating manual.
- The device is intended exclusively for separating pre-scored PCB's. Any other use or use going beyond this shall be regarded as improper use. The manufacturer/supplier shall not be liable for damage resulting from unauthorized use; the user shall bear the risk alone.
- Usage for the intended purpose also includes complying with the operating manual, including the manufacturer's maintenance recommendations and specifications.



#### **Notice!**

**The complete documentation can also currently be found in the Internet.**

### 1.3 Safety Instructions

- The device is configured for voltages of 100 or 240 V AC. It only has to be plugged into a grounded socket.
- Hazard by electrical charge. Provide an earthing connection via press stud.

- Only connect the device to other devices which have a protective low voltage.
- Switch off all affected devices (e.g. conveyor belt) before connecting or unlinking.
- Risk of hand injury. Wear protective gloves while PCB separating.
- Ensure that people's clothing, hair, jewelry etc. do not come into contact with the exposed rotating blade.
- In an emergency situation, actuate the emergency stop switch in the control panel by tight pressing. This interrupts the voltage supply to the device.
- The device may only be used in a dry environment, do not expose it to moisture (sprays of water, mists, etc.).
- Do not use the device in an explosive atmosphere.
- Do not use the device close to high-voltage power lines.
- Work going beyond this may only be performed by trained personnel or service technicians.
- Unauthorized interference with electronic modules or their software can cause malfunctions.
- Other unauthorized work on or modifications to the device can also endanger operational safety.
- There are various warning stickers on the device. They draw your attention to dangers.  
Warning stickers must therefore not be removed, as then you and other people cannot be aware of dangers and may be injured.

**Danger!**

**Danger to life and limb from power supply.**

- **Do not open the device casing.**

Technical data		4S/450	4S/600
Separation type		Component side:	circular blade
		Soldering side:	linear blade
Operation		motorized and optimized	
Separation speed		300/500 mm/sec. switchable	
Material		FR4, Aluminium	
Height of components		Component side/Soldering side up to 34 mm	
Cutting length , continuous F		up to 450 mm	up to 600 mm
Length D		702 mm	852 mm
Depth storage table		200 mm	
Programming			
Home		Request drive to starting position, Acknowledge	
Speed		H (High): 500 mm/Sek.	
		L (Low): 300 mm/Sek.	
Program		9	
Step (cutting steps)		1 – 5	
Distance (between blades)		0,9 mm bis 0,05 mm	
Key switch button		Release of programming	
Mileage (Kilometer counter)		up to 99 km	
DEL		Reset of the kilometer counter	
Power switch		ON/OFF	
Foot switch		START Separation	
Safety switch		Emergency stop	
Spannung		100–240 V~ 50/60 Hz	
Emission sound pressure level		LpA < 70 dB (A)	
Temperature / humidity not condensing	Operation	+10–35°C	/ 10–85%
	Stock	0–60°C	/ 20–80%
	Transport	-25–60°C	/ 20–80%
Weight		38 kg	46 kg
Height/Depth		434x425 mm	
Width		702 mm	852 mm
Approvals		CE, FCC class A	

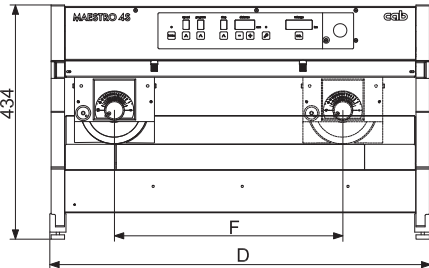
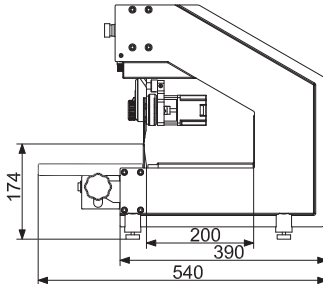
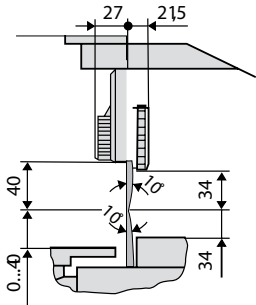
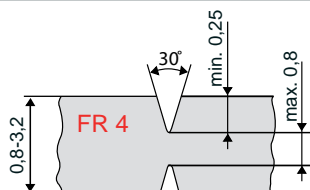
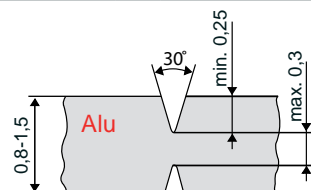
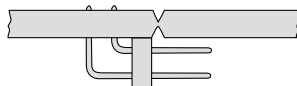
Dimension		Maximum Height of components on the cut nut	
			
			
Enlargement of the PCB outside after separation.		typical 0,2 mm	
			
The cut nut could be broken by a cutout.			
In case of overlaying components, the linear blad must be hollowed.			
If required request.			

Table 1 Technical data

### 3.1 Views without covers and cable

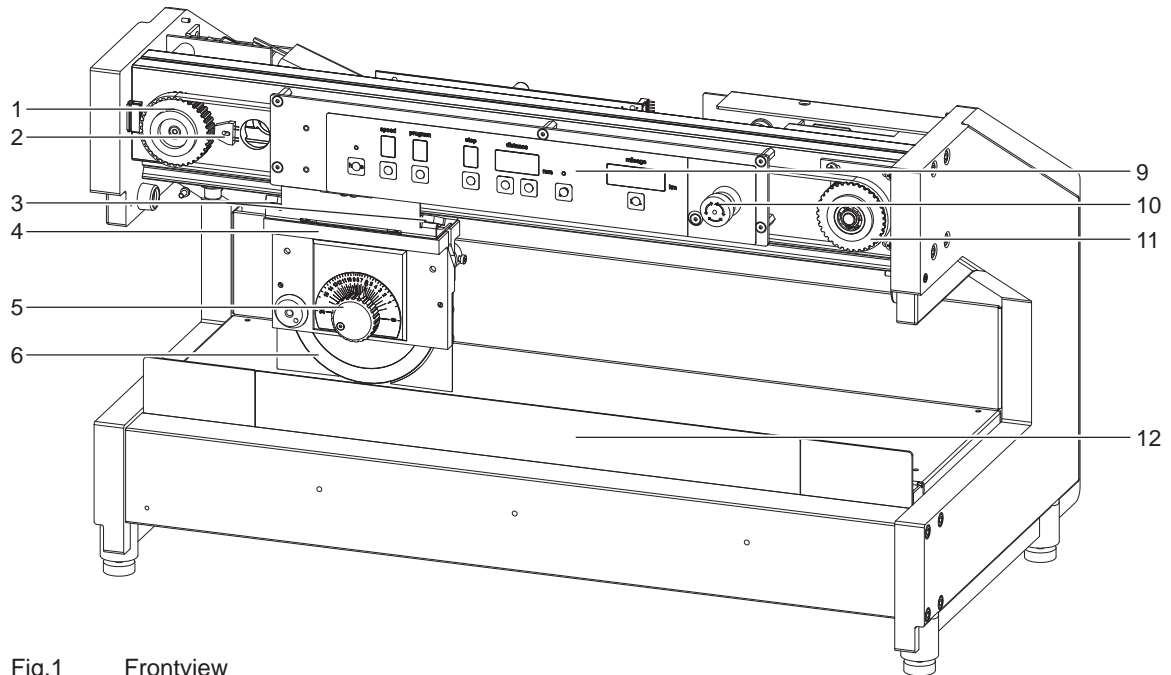


Fig.1 Frontview

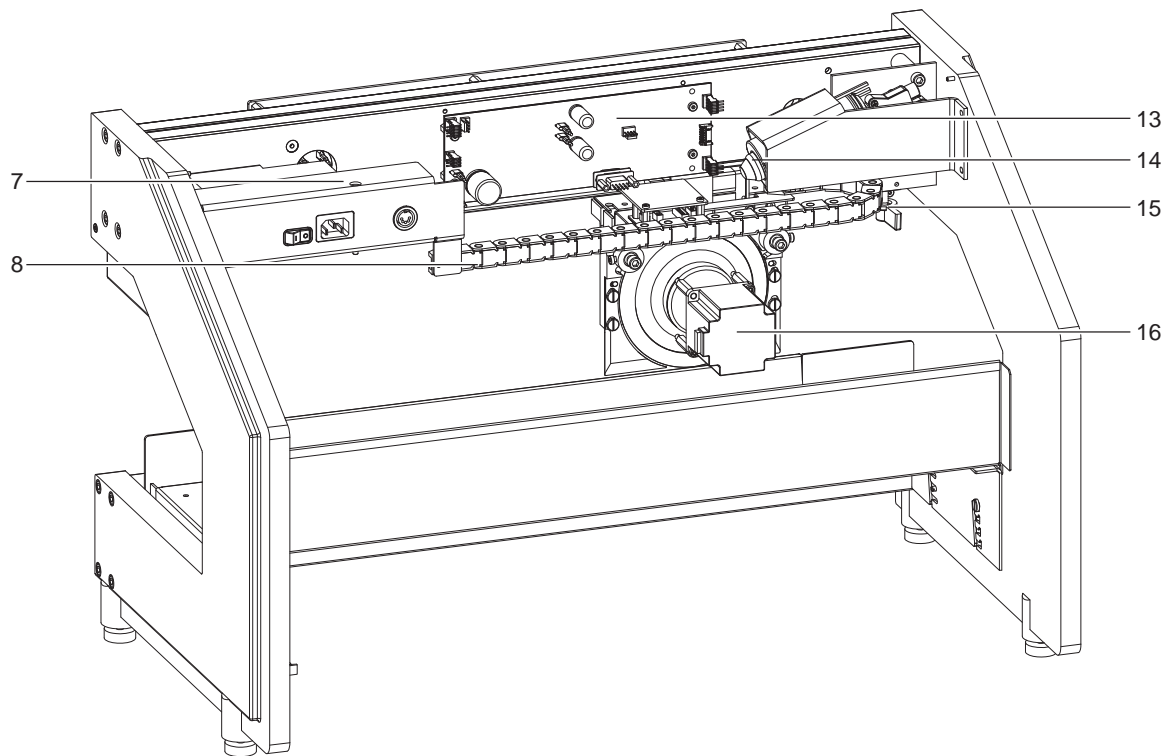


Fig.2 Rearview

- |                                 |                         |
|---------------------------------|-------------------------|
| 1 Belt Gear Main Motor          | 9 Control Panel         |
| 2 Pulse Sensor                  | 10 Emergency Switch     |
| 3 Carriage Sensor right / Links | 11 tension Wheel        |
| 4 Carriage                      | 12 Linear Blade         |
| 5 Set knob for cutting depth    | 13 PCB Control          |
| 6 Upper Circular Blade          | 14 Main Motor           |
| 7 Power Supply                  | 15 Clutch Main Motor    |
| 8 Energy Track                  | 16 Motor Circular Blade |

### 3.2 Tools

- Do not use any worn or damaged tools.
- Only use tools and testing devices that are suitable for the task at hand.

#### Special tools (cab production):

- Dial gauge assembly (cab part No. 8970208) to check the blade position

#### Commercial tools:

- Allen key 1,5, 2,0, 2,5, 5,0 mm
- Jaw wrench 5,5 mm
- Phillips-head screwdriver, size 1
- Precision Snap Ring Caliper A0
- Precision Snap Ring Caliper A1
- Oscilloscope

### 3.3 Contents of Delivery

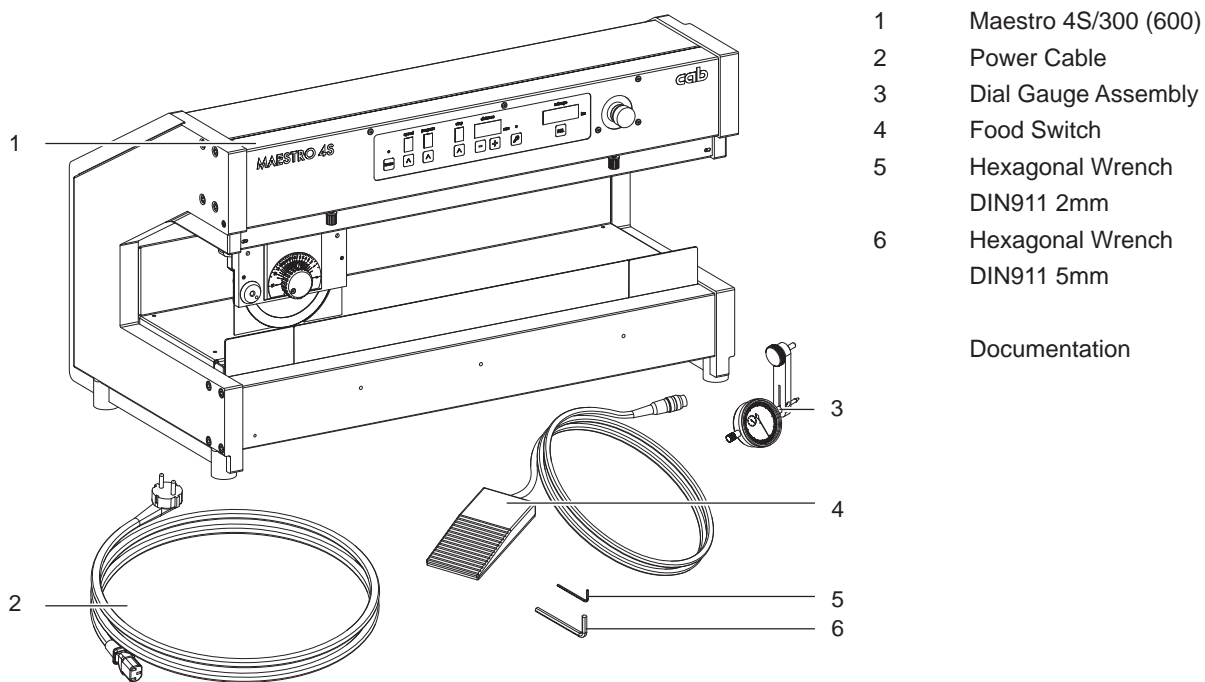


Fig.3 Contents of Delivery



## 4.1 Changing the Upper Blade

In case of wasting, damage or material modified it's necessary to change the upper blade.

**Video**

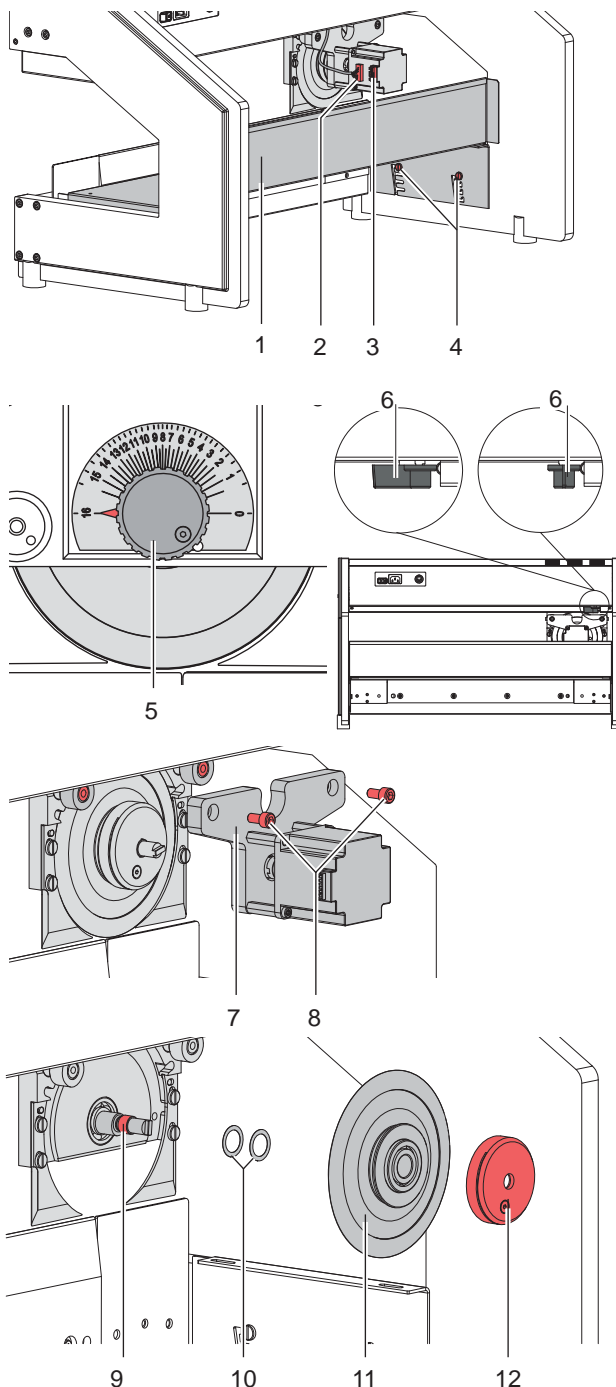
[Video: MAESTRO 4S - Changing the upper blade on www.cab.de](http://www.cab.de)

**Risk of hand injury !**

► Wear protective gloves while changing the blade.

**Danger!**

**Risk of cutting damage by rotating blade!**  
**Unlink device before you start service work!**



1. After switching off the device and unlinking from power supply, pull connector (2) out from female connector (3) on the motor.
2. Slide the carriage to the left end position (front view). Like upper picture.
3. Set the setting knob (5) on value 16 - blade on the highest position.
4. Swing lever (6) in position a to release.
5. Loosen screws (4) and remove table (1) by movements back and top.
6. Loosen screws (8).
7. Remove motor carriage with mounted motor (7).
8. Hold the setting knob (5) and loosen the knurled nut(12) .
9. Remove blade (11) . It's possible that the washer (10) are adhere on the blade. Remove the Washer (10) from blade and take it back on the axle (9).
10. Take the new blade (11) on the axle (9).
11. Hold the setting knob (5) and tighten the knurled nut(12) .
12. Set the setting knob (5) on value 16.
13. Mount motor carriage with mounted motor (7), check the connection of the coupling motor/axle and tighten screws (8) .
14. Swing lever (6) in position b to couple.
15. Hang up the table (1) and tighten screws (4) .
16. Put in connector (2) into female connector (3) on the motor.

**Notice!**

**Adjust the stopper of the upper blade before you start operation. ► chapter 4.2**

Fig.4 Changing the upper blade

## 4.2 Adjustment of the Upper Blade Stopper



### Notice!

The lower stop of the upper blade adjustment is already adjusted by delivery.

- After a long operation time, while working at strongly varying temperatures or else after replacing a blade, it is recommended to re-adjust the lower stop.

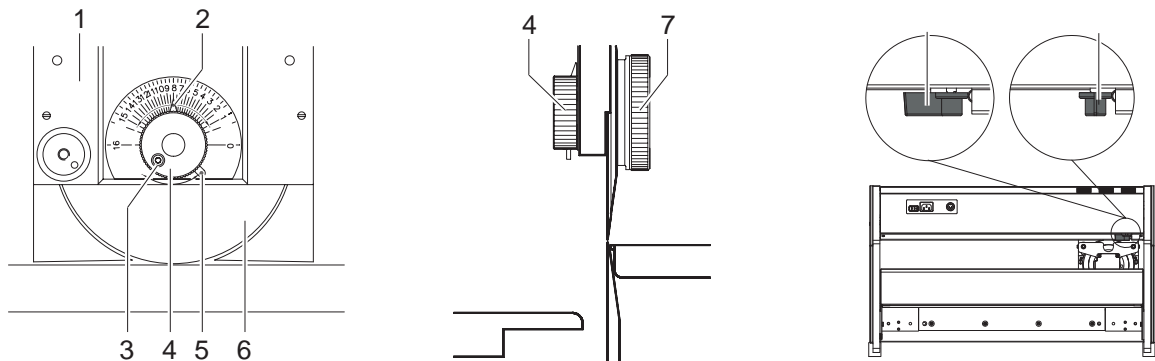


Fig.5 Adjustment of the upper blade stopper

1. Move the lever (8) to the position 'a'. The motor drive to the blade carrier (1) is now disconnected.
2. Rotate the pointer (2) with the knob (4) counterclockwise to position "16".
3. Move the upper blade carrier (1) in the middle position of the lower blade.
4. Loosen the screw (3).
5. Move the knob (4) clockwise until the upper and lower blades are in a distance of 0.03 mm. Use a thickness gauge.
6. Swing the strut (5) clockwise until you reach the stop and tighten the screw (3). This adjustment locks the upper blade in place to prevent it from moving out of adjustment.
7. Move the lever (8) to the position 'b'. The motor drive to the blade carrier (1) is now reconnected.

## 4.3 Changing the Linear Blade



Video

[Video: MAESTRO 4S - Changing the linear blade on www.cab.de](http://www.cab.de)
**Warning!**

Risk of cutting injury in handling of the linear blade.

**Risk of hand injury !**

► Wear protective gloves while changing the blade.

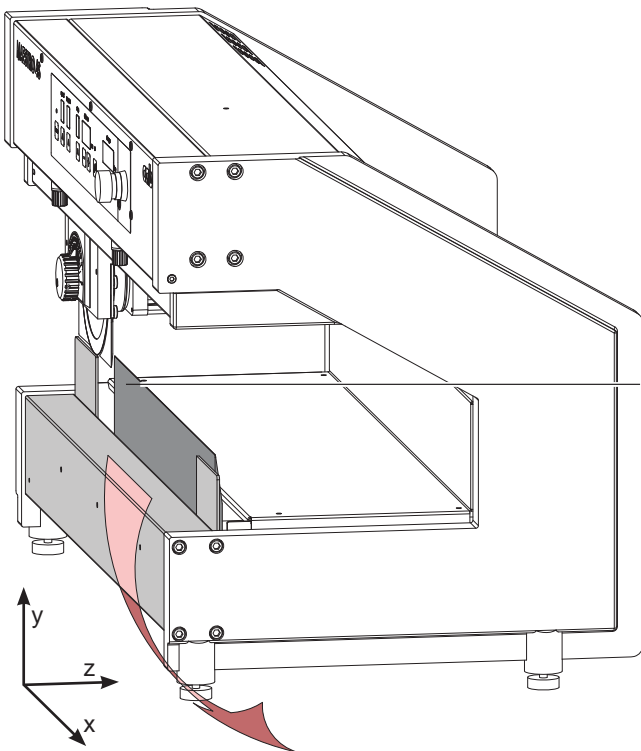


Fig.6 Changing the linear blade  
(Front view - inclined)

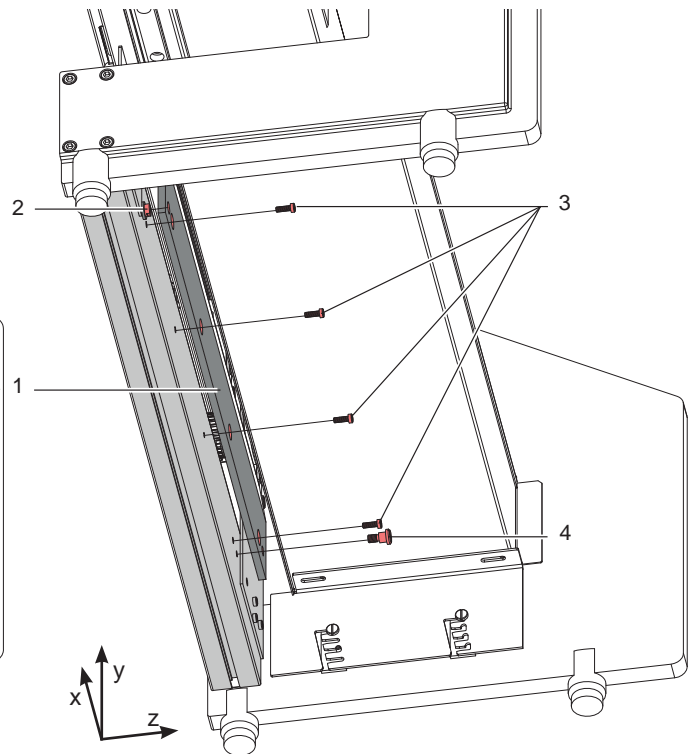


Fig.7 Changing the linear blade  
(Bottom view - inclined)

1. Loosen shouldered screw (4).
2. Hold the linear blade (1) to avoid an uncontrolled fall of the blade.
3. Loosen screws (3) . The eccentric (2) will be used for guiding and will not be loosened .
4. Pull out the linear blade (1) in direction of the device rear side from eccentric (2).
5. Move out the linear blade (1).
6. Mounting of the new linear blade in reverse order.

## 4.4 Adjusting the Linear Blade

**Warning!**

Risk of cutting injury in handling of the linear blade.

To ensure a constant cutting quality and to prevent damaging of the blades must adjust the linear blade so that the distance between upper blade and linear blade is constant of the full cutting length.



### Attention!

Decouple the carriage before move the carriage by hand . Damage the electronics!

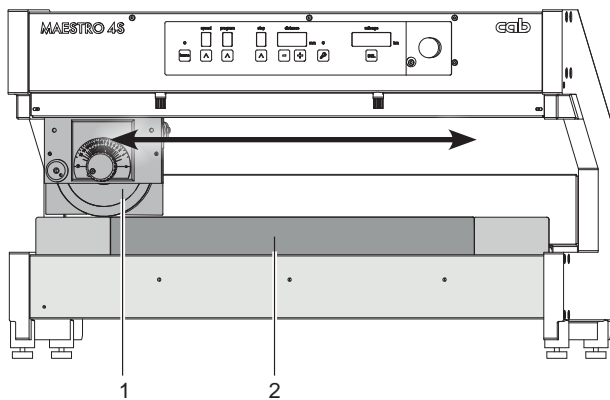


Fig.8 Setting of the linear blade (Front view)

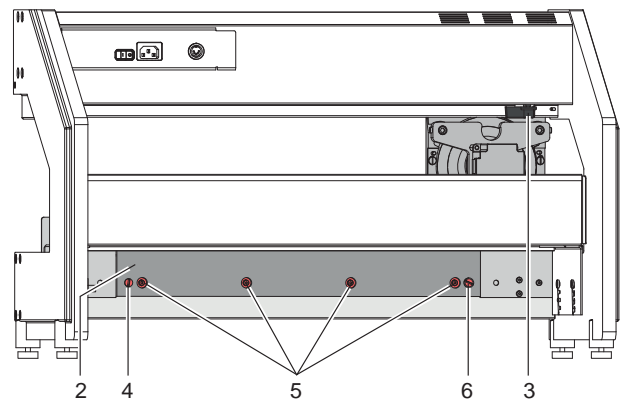


Fig.9 Setting of the linear blade (Rear view)

1. Decouple the carriage (1) from motor by the lever (3).
2. Turn upward the upper blade by the setting knob on the carriage (1).
3. Pull the carriage (1) over the full cutting length. The Distance between upper blade and linear blade (2) must be constant over the full length.
4. Repeat this activity with reduced distance between upper blade and linear blade (2) up to a possible variation in the distance is visible.
5. Are variation in the distance visible, loosen screws (5) .
6. Turn the eccentric (4) to adjust the linear blade (2). The shouldered screw (6) are the axle of rotation and by turning the eccentric (4) will the linear blade (2) lifted or put down.
7. Repeat the setting and check up to the distance is over the full cutting distance the same.
8. Tighten screws (5).

## 4.5 Check the Blade Alignment



### Notice!

When the machine is put into operation for the first time, or following a move of equipment or a change of blades, it is advantageous to re-check the alignment of the blades in relationship to one another. For this purpose a dial gauge assembly (Part No. 8970208) is available as an option.

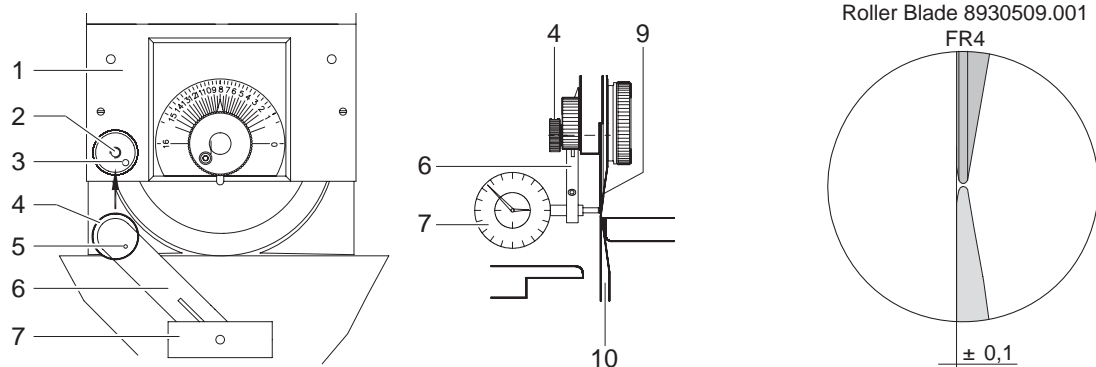


Fig.10 Check the blade alignment

1. Move the blade carrier (1) to the middle of its range of travel.
2. Affix the dial gauge assembly onto the threaded hole (2) in the blade carrier and screw tight with the knurled screw (4) provided. Ensure that the small spigot (5) mounted on the inside of the lever (6) locates correctly into the hole (3) provided in the blade carrier.
3. Swing the lever (6) upwards until the tip of the gauge feeler (7) presses onto the upper blade (9) at 2 mm of the edge of the blade. Rotate the scale on the dial gauge until the pointer in the 1/100 mm division is lined up with the „0“ on the scale.
4. Swing the lever (6) downwards until the tip of the gauge feeler (7) presses onto the lower blade (10) at 2 mm of the edge of the blade.
5. In the event of the values obtained by the above procedure being greater than the values , the servicing agent responsible for your machine should be contacted.
6. Remove the dial gauge assembly.

## 4.6 Changing the hub to main motor

**Danger!**

Danger to life and limb from power supply.

► Befor open the device unlink the power!

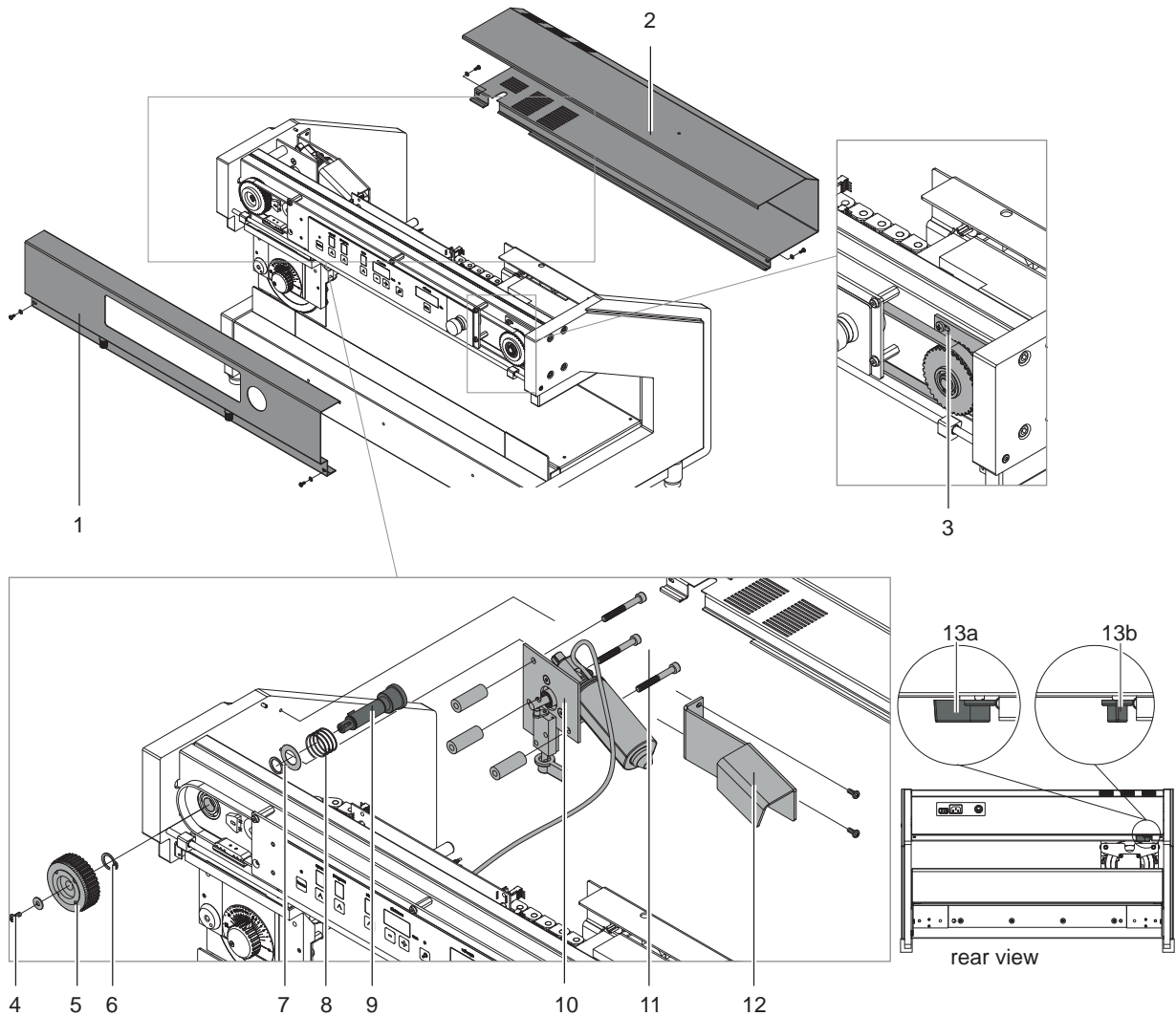


Fig.11 Dismount the hub to the main motor

1. Swing lever (13) in position b to connect the blade with the motor and to relax spring (8) .
2. Dismount front (1) and rear (2) cover.
3. Loosen the three screws (3) and move the tension wheel (5) to the center to relax the belt.
4. Loosen screw (4) and remove the belt gear (5) .
5. Dismount cooling bracket (12) .
6. Remover motor assembly (10) after loosening screws (11) .
7. Remove snap ring (6) with a snap ring caliper.
8. Pull out the hub (9) with spring (8), washer and snap ring (7) .
9. Remove snap ring (7) with a snap ring caliper and remove washer and spring (8) .

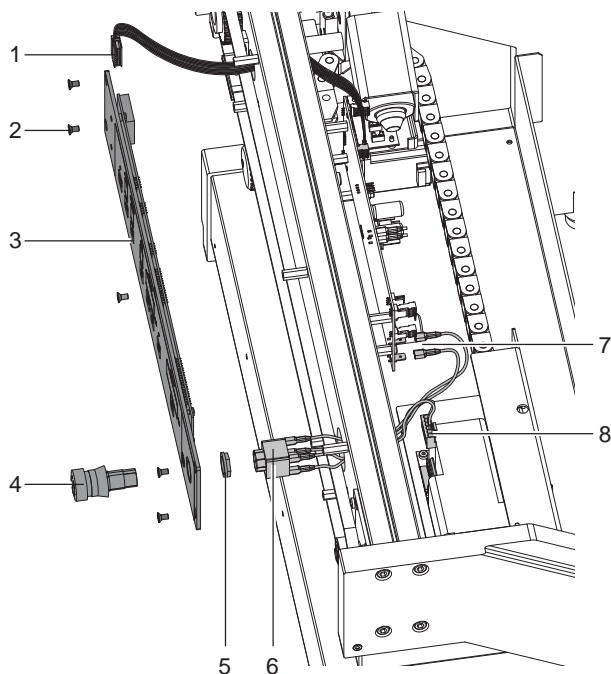
► Mounting the new hub in reverse order.

## 4.7 Changing the Control Panel / Emergency Switch

**Danger!**

Danger to life and limb from power supply.

► Befor open the device unlink the power!



1. Dismount front and rear cover.  
▷ „Changing the hub to main motor“ on page 13
2. Pull out the connector (3) on the power supply to the emergency switch.
3. Pull both Push-on-contacts (7) on the PCB to the emergency switch.
4. Loosen screws (2).
5. Pull out connector (1) on the control panel (3).
6. Turn the lower part of the emergency switch (6) short only approx. 10° and remove it.
7. Loosen nut (5) and remove the upper part (4) of the emergency switch.

► Mounting of the control panel (3) / emergency switch in reverse order.

Fig.12 Dismount control panel / emergency switch

## 4.8 Changing the Belt

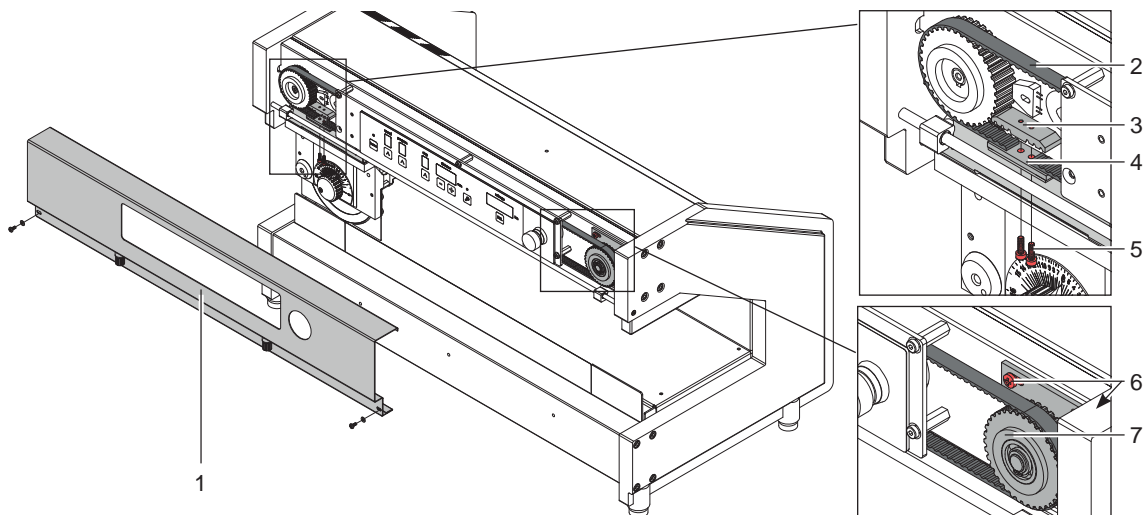


Fig.13 Changing the belt

1. Dismount front cover (1).
2. Loosen the three screws (6) and move the tension wheel (7) to the center to relax the belt (2) .
3. Loosen screws (5) and remove the upper catch plate (3).
4. Change the belt (2) and put it over the tension wheel and belt gear.
5. Put in the belt (2) so that the ends are between the lower catch plate (4) upper catch plate (3). but the both screw holes must be free.
6. Put in screws (5) and tighten it.
7. Move the tension wheel (7) to th right side (outside), tension the belt (2) and tighten screws (6).
8. Mount the front cover (1).

## 4.9 Changing the Energy Track

**Danger!**

Danger to life and limb from power supply.

► Before open the device unlink the power!

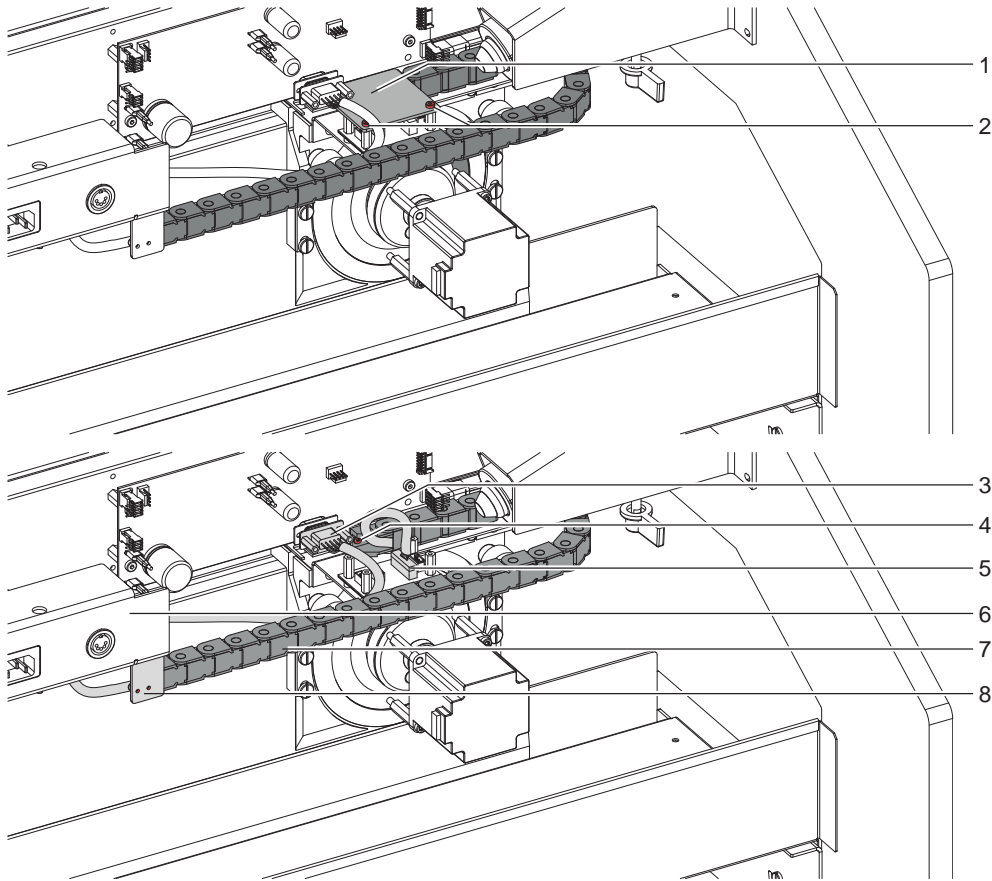


Fig.14 Energy track mount / dismount

1. Dismount the rear cover. ► Page 13
2. Loosen screws (2) and remove PCB cover (1) .
3. Pull connector (3 and 4) and put out the cable from the cable retainer on the power supply (7) .
4. Loosen screws (4) and (8) .
5. Remove the energy track (7) .

► Mounting the energy track (7) in reverse order.

## 4.10 Check the Sensors

Some sensors are integrated into the Maestro 4S to control the function and operation of the device. This are reflex sensors with a switch reaction in case a surface are in front of approx. 3mm distance. For changing and adjusting is a 5,5 mm jaw wrench necessary.

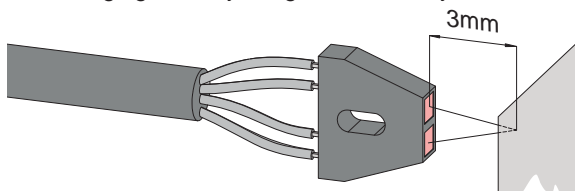


Fig.15 Reflex sensor



## 4.10.1 Check the Sensors via Control Panel

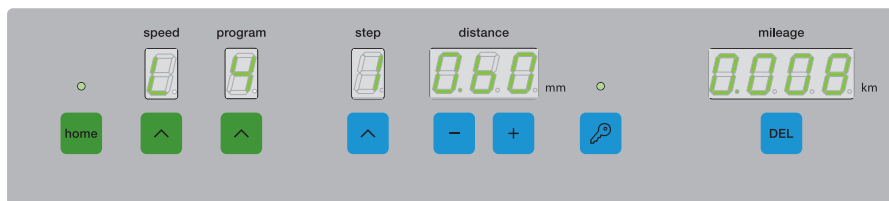


Fig.16 Control Panel

- ▶ Switch of the machine.
- ▶ Ungear the carriage.
- ▶ Press the button combination to choice the test mode and switch on the machine.
- ▶ Move the carriage to switch on/off the sensors.
- ▶ To leave the test mode switch of the machine.

**Notice!**

You can test the sensors on the carriage only with a mounted front cover.

Sensor	Button combination to choice the test mode	Display
clock sensor 	Press button  (home) and  (plus) at once time.	 Display speed switched between  and
side sensor left 	Press button  (home) and  (speed) at once time.	 Display mileage switched to
side sensor right 	Press button  (home) and  (speed) at once time.	 Display mileage switched to
carriage sensor left 	Press button  (home) and  (speed) at once time.	 Display mileage switched to
carriage sensor right 	Press button  (home) and  (speed) at once time.	 Display mileage switched to

Table 2 Check the Sensors via Control Panel



## 4.10.2 Check the Sensors on PCB

Some sensors are integrated into the Maestro 4S to control the function and operation of the device. This are reflex sensors with a switch reaction in case a surface are in front of approx. 3mm distance. For changing and adjusting is a 5,5 mm jaw wrench necessary.

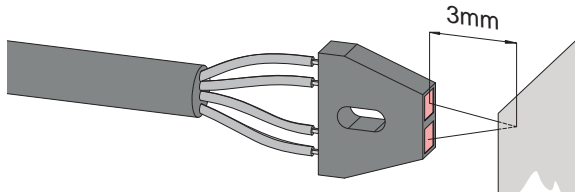


Fig.17 Reflex sensor

To check the function of a sensor are checkpoints on the PCB integrated.

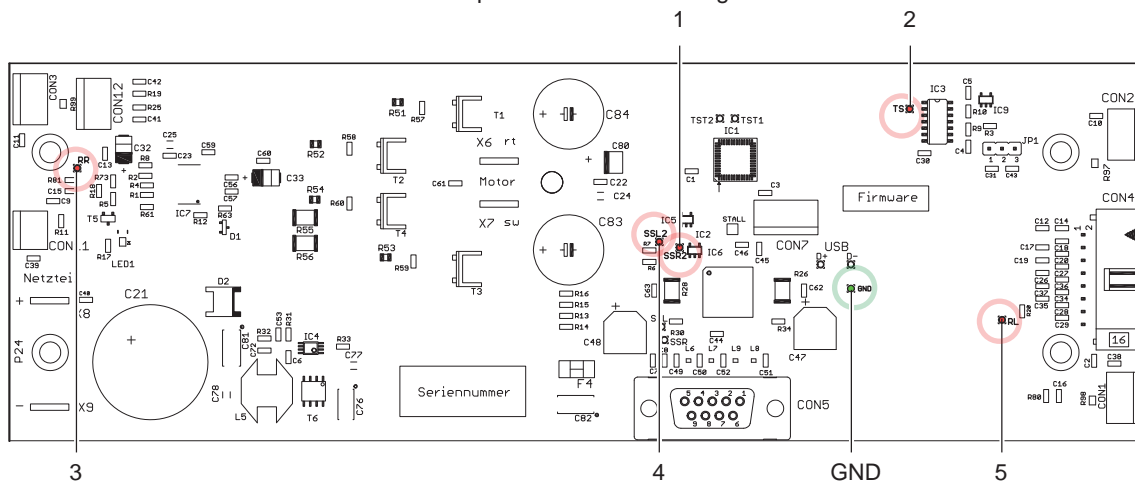


Fig.18 Checkpoints to check the sensor function

Nr.	Bezeichnung	Sensor
1	SSR 2	carriage sensor right
2	TS	pulse sensor
3	RR	side sensor right
4	SSL 2	carriage sensor left
5	RL	side sensor left
	GND	Ground

Table 3 Sensor - short description

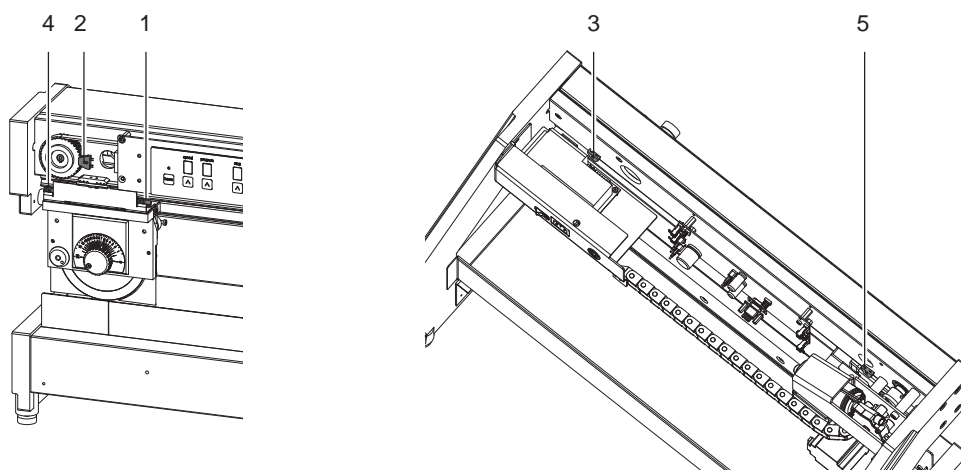


Fig.19 Sensor position

It will measured with a Oscilloscope in a measurement range of 1 or 5 Volt per scale deviation.

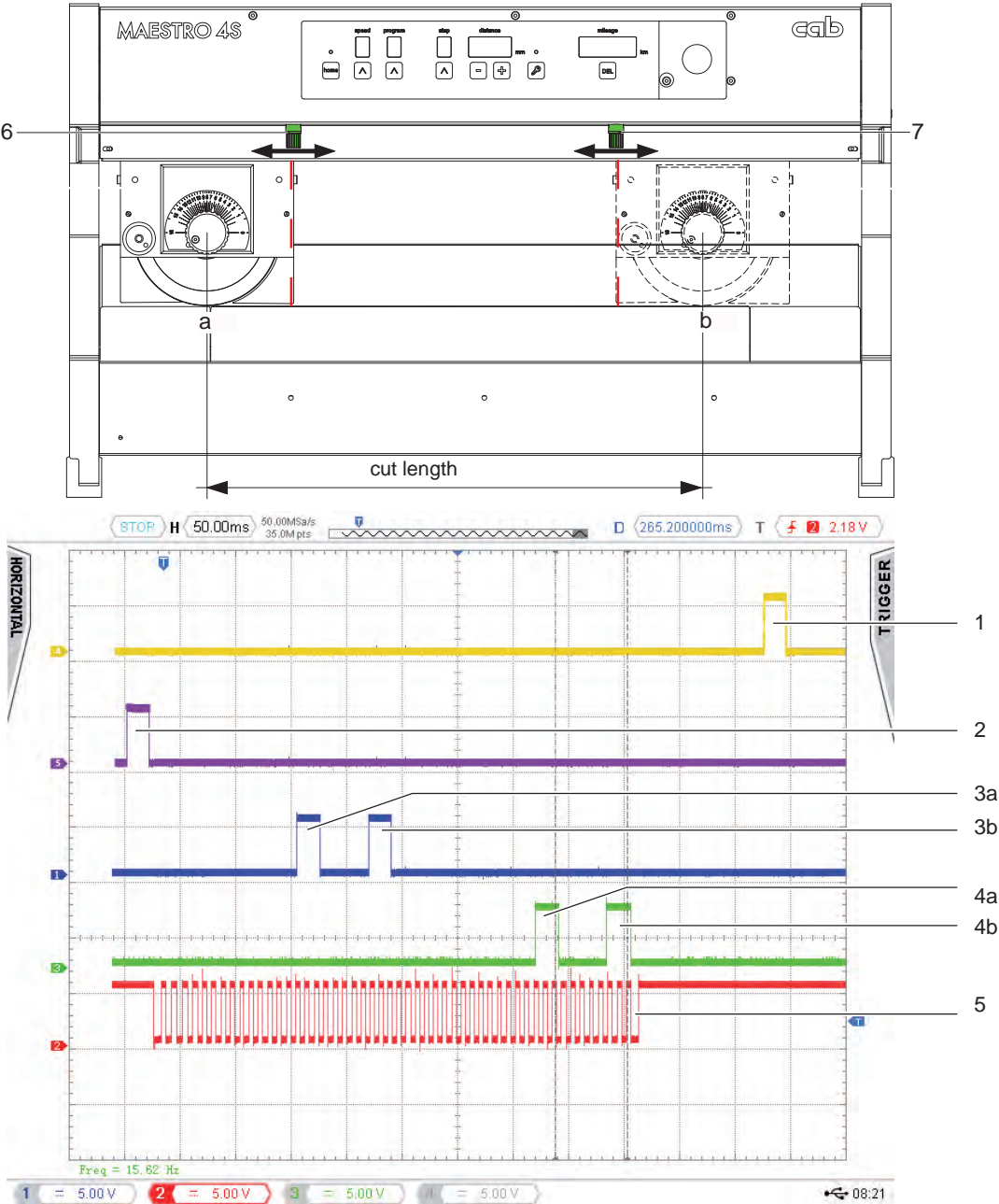


Fig.20 Measurement by Oscilloscope

	Pulse sensor	Carriage sensor right	Carriage sensor left	Edge sensor right	Edge sensor left
1	-----	-----	-----	End Position right	-----
2	-----	-----	-----	-----	End Position Left
3a	-----	Cut stopper (6)	-----	-----	-----
2a	-----	-----	Cut stopper (6)	-----	-----
3b	-----	Cut stopper (7)	-----	-----	-----
4b	-----	-----	Cut stopper 7)	-----	-----
5	Start position to the end of cut	-----	-----	-----	-----

Table 4 Sensor peak 1. cut

Cause of error	Effect / Display	Error recovery
The food-switch is clear in the moment of synchronization	LED <b>not ready</b> Display <b>step</b> Display <b>distance</b> Display <b>cut length</b> } blink	<ul style="list-style-type: none"> <li>▶ Switch of the device and switch it on again.</li> <li>▶ New synchronization</li> </ul>
The device is switched on and the carriage with the upper blade will moved by hand out of the start position		
The carriage with the upper blade is blocked in operation.	LED <b>not ready</b> blink	<ul style="list-style-type: none"> <li>▶ Press button <b>home</b></li> <li>▶ Press the foot-switch and hold it ⇒ Device will run into the start position</li> <li>▶ Clear the foot-switch</li> <li>▶ A new activation of the food-switch will continue the program with a replay of the last cut.</li> </ul>
The food-switch will be clear if the program is running.		
Material is not separated after program end	_____	<ul style="list-style-type: none"> <li>▶ Switch of the device and make a new synchronization .</li> <li>▶ Chang programming <ul style="list-style-type: none"> <li>- More cuts</li> <li>- Reduce the distance between upper and lower blade in smaller steps</li> </ul> </li> </ul>
Pulse sensor fault or wrong adjust	Carriage moved short in one direction and stopt with a jerk. LED <b>not ready</b> blink	▶ Sensor adjust or replace
Side sensor right/left fault or wrong adjust	Carriage moved with full speed on the side and stopt on the mechanical end. It moved back a short part and stoppt. The same procedur like "carriage or Blade are blocked". LED <b>not ready</b> blink	▶ Sensor adjust or replace
Carriage sensor right/left fault or wrong adjust	In spite of other settings moved the carriage over the full distance of the possible cut length. The operation doesn't stop and it will not shown an error message.	▶ Sensor adjust or replace

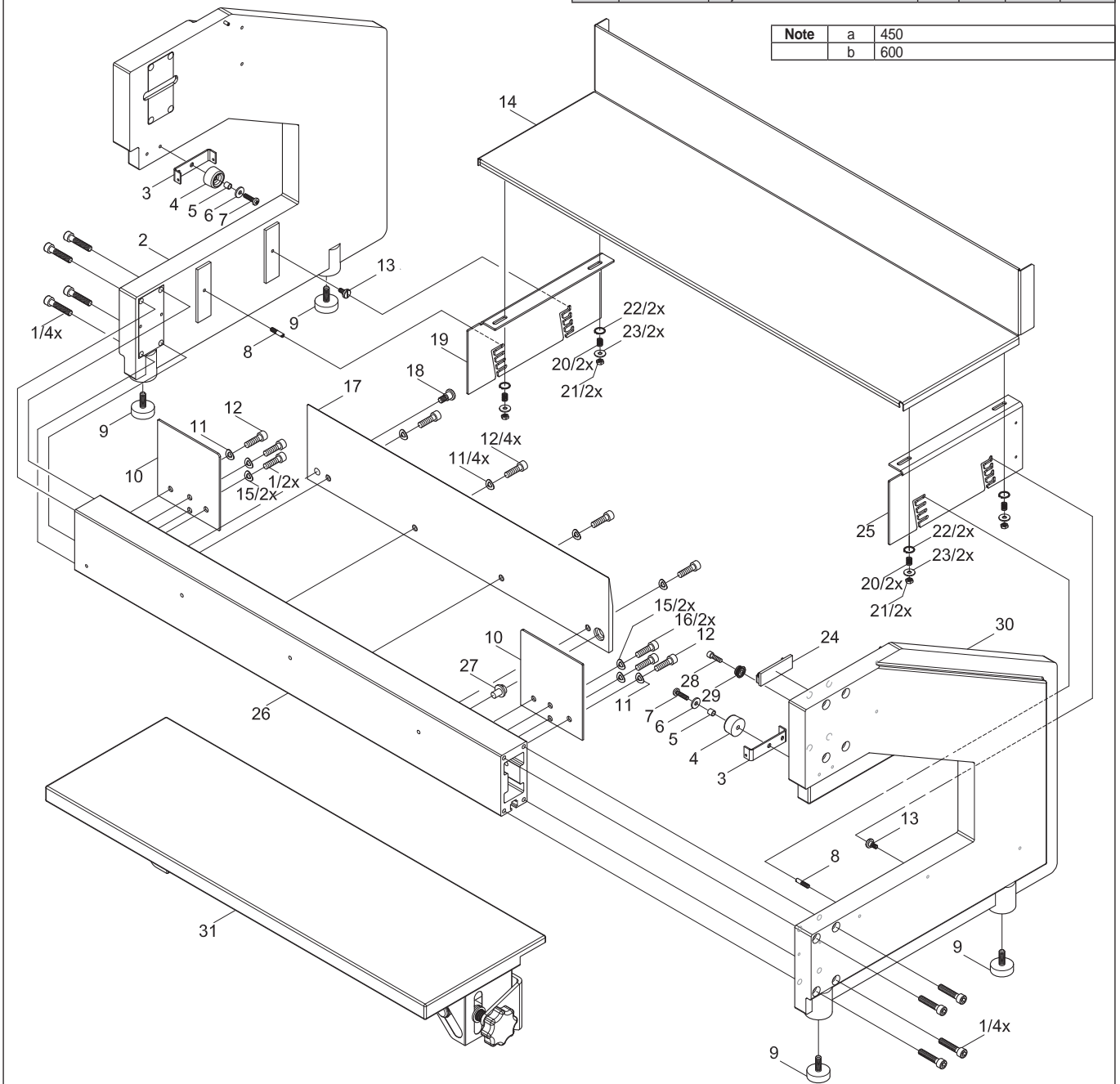
Table 5 Errors in operation and handling

## 6.1 Side Parts C Profile, Linear Blade

No	Part No.	Description	PU	Note	Serial No.	
					from	to
1	5902082.001	Screw DIN912-M6x30	10			
2	8936866.001	C Profile	1			
3	8930823.001	Bracket	1			
4	5905141.001	Foot	5			
5	8930946.001	Bushing	1			
6	5903520.001	Washer DIN7349-4.3	10			
7	5902052.001	Screw DIN7985 M4x16	10			
8	8930818.001	Set Screw	10			
9	5905372.001	Buffer	1			
10	8930949.001	Blade Shield	1			
11	5903010.001	Spring Washer DIN137-A6	10			
12	5902169.001	Screw DIN912-M6x14	10			
13	8930646.001	Knurled Screw	1			
14.1	8930884.001	Table	1	a		
14.2	8931182.001	Table	1	b		
15	5903012.001	Spring Washer DIN137-A5	10			
16	5902159.001	Screw DIN912-M5x12	10			

No	Part No.	Description	PU	Note	Serial No.	
					from	to
17.1	8933394.001	Linear Blade	1	a		
17.2	8933682.001	Linear Blade	1	b		
18	5902122.001	Screw DIN923-M6x6	10			
19	8930886.001	Comb	1			
20	5905079.001	Spring	1			
21	5902501.001	Nut DIN934-M4	10			
22	5903527.001	Snap Ring DIN471-10x1	10			
23	5903005.001	Washer DIN9021-4.3	10			
24	5901561.001	Cable Clamp	10			
25	8930885.001	Comb	1			
26.1	8930959.001	Beam	1	a		
26.2	8931185.001	Beam	1	b		
27	8930605.001	Eccentric Axle	1			
28	5902241.001	Screw DIN7984-M4x10	10			
29	5905116.001	Ground Button	1			
30	8936864.001	C Profile	1			
31.1	8931120.001	Adjustable Platform	1	a		
31.2	8931186.001	Adjustable Platform	1	b		

Note		
a	450	
b	600	

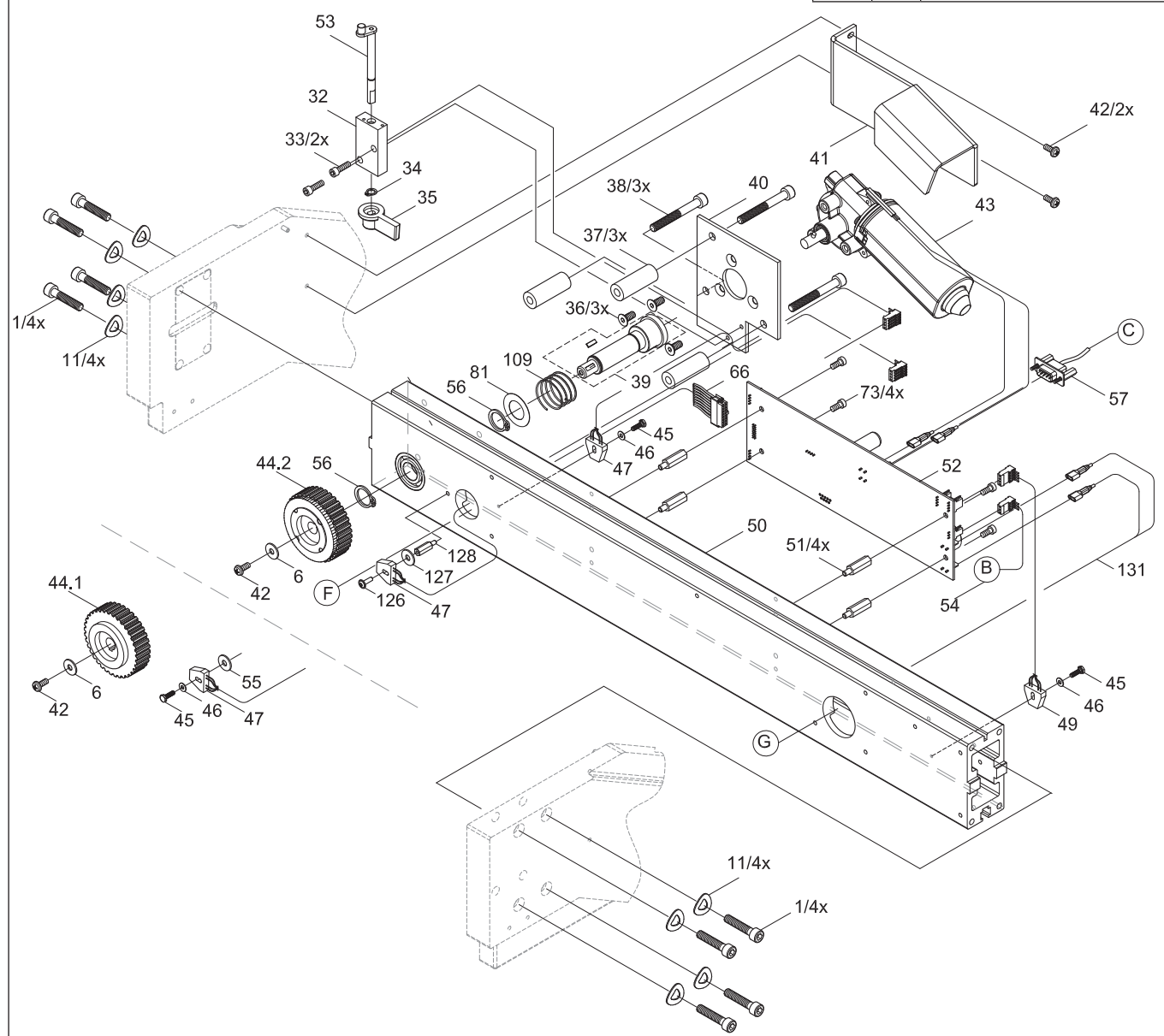


## 6.2 Main Motor

No	Part No.	Description	PU	Note	Serial No.	
					from	to
1	5902082.001	Screw DIN912-M6x30	10			
6	5903520.001	Washer DIN7349-4.3	10			
11	5903010.001	Spring Washer DIN137-A6	10			
32	8930988.001	Bearing Plate	1			
33	5902014.001	Screw DIN912-M4x14	10			
34	5903521.001	Snap Ring DIN471-A6	10			
35	5530340.001	Lever	1			
36	5902161.001	Screw DIN7991 M6x10	10			
37	8930857.001	Spacer	1			
38	5902263.001	Screw DIN912-M6x50	10			
39	8936883.001	Hub	1			
40	8936855.001	Motor Plate	1			
41	8936877.001	Heatsink Bracket	1			
42	5902483.001	Screw DIN6912-M4x10	10			
43	8936856.001	Main Drive	1			
44.1	8930809.001	Gear 36	1			4374
44.2	8936940.001	Gear 36	1		4375	
45	5902245.001	Screw DIN933-M3x10	10			4374
46	5903004.001	Washer DIN125-A3.2	10			
47.1	8930916.001	Sensor	1	a		
47.2	8936916.001	Sensor	1	b		

No	Part No.	Description	PU	Note	Serial No.	
					from	to
49	8930915.001	Edge Sensor	1			
50.1	8936858.001	Beam	1	a		
50.2	8936898.001	Beam	1	b		
51	8936871.001	Bolt	1			
52.1	8936814.001	PCB Control	1			4374
52.2	8936937.001	PCB Control	1		4375	
53	8930985.001	Coupler	1			
54	8936896.001	Bushing	1			
55	5903062.001	Washer 3.2x9.0x1.5	10			4374
56	5903539.001	E-Ring DIN471-16x1	10			
57.1	8936846.001	Energy Track	1	a		
57.2	8936847.001	Energy Track	1	b		
66	8936804.001	Cable	1			
73	5902358.001	Screw DIN7984-M4x6	10			
81	8930992.001	Washer	1			
109	5905040.001	Spring	1			
126	5902908.001	Screw M3x10	10			4375
127	5903125.001	Washer DIN9021-3.2	10			4375
128	5900025.001	Distance Bolt M3x14	10			4375
131	8936805.001	Emergency Switch	1			

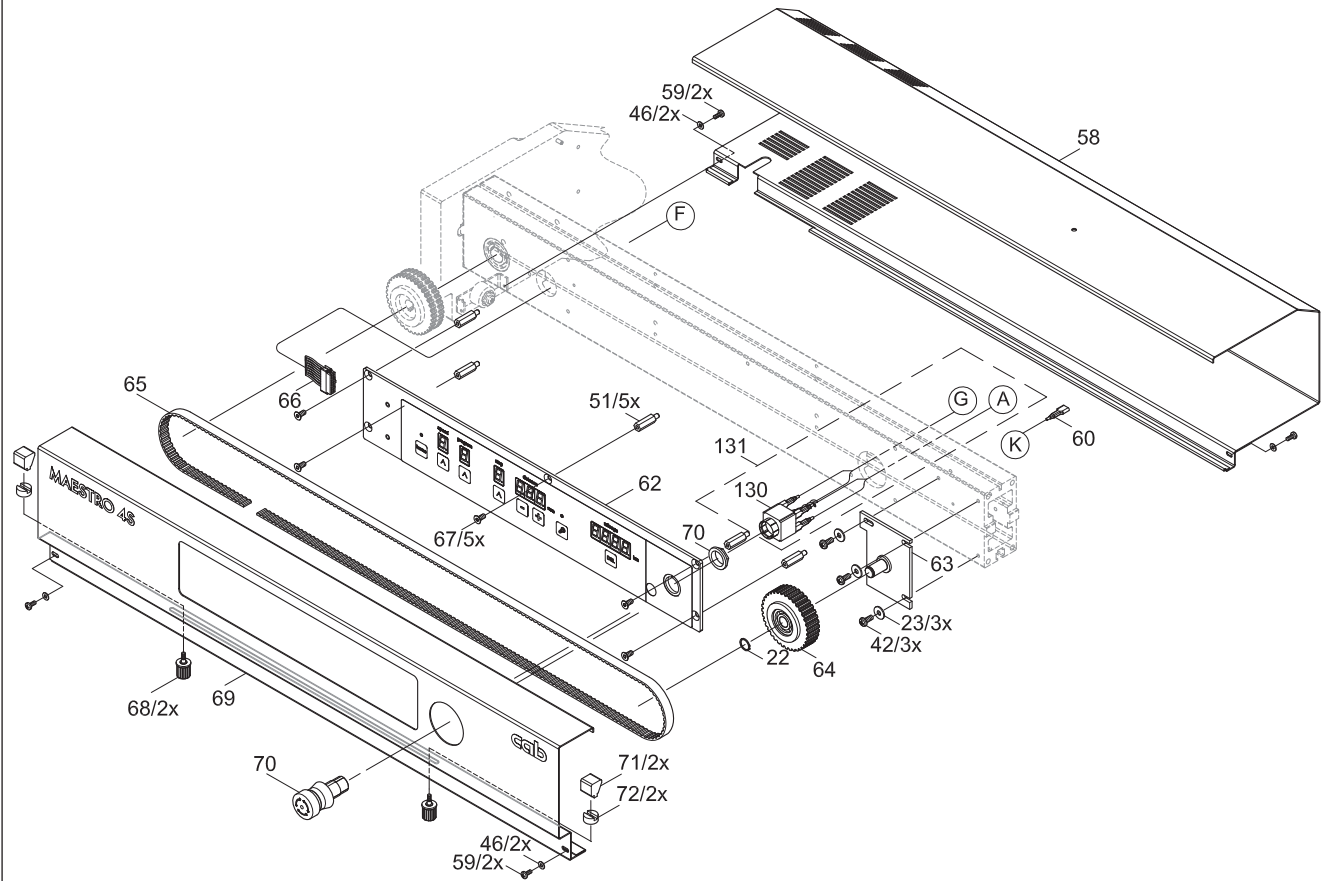
Note		
	a	450
	b	600



6.3 Upper Beam, Control Panel

No	Part No.	Description	PU	Note	Serial No.	
					from	to
22	5903527.001	Snap Ring DIN471-10x1	10			
23	5903005.001	Washer DIN9021-4.3	10			
42	5902483.001	Screw DIN6912-M4x10	10			
46	5903004.001	Washer DIN125-A3.2	10			
58.1	8936822.001	Cover	1	a		
58.2	8936862.001	Cover	1	b		
59	5902026.001	Screw DIN7985-M3x6	10			
60	8930981.001	Cable Grounding	1			
61	8936871.001	Bolt	1			
62	8936870.001	Control Panel	1			
63	8930868.001	Tightener	1			
64	8930854.001	Tensioning Wheel	1			
65.1	8930961.001	Belt	1	a		
65.2	8931181.001	Belt	2	b		
66	8936804.001	Cable	1			
67	5902304.001	Screw DIN7991-M4x6	10			
68	8936834.001	Knurled Screw	1			
69.1	8936821.001	Cover	1	a		
69.2	8936867.001	Cover	1	b		
70	5917167.001	Emergency Switch Push Button	1			
71	8936837.001	Stopper	1			
72	8936891.001	Washer	1			
130	5917168.001	Switch Unit	1			
131	8936805.001	Emergency Switch	1			

Note	a	450
	b	600

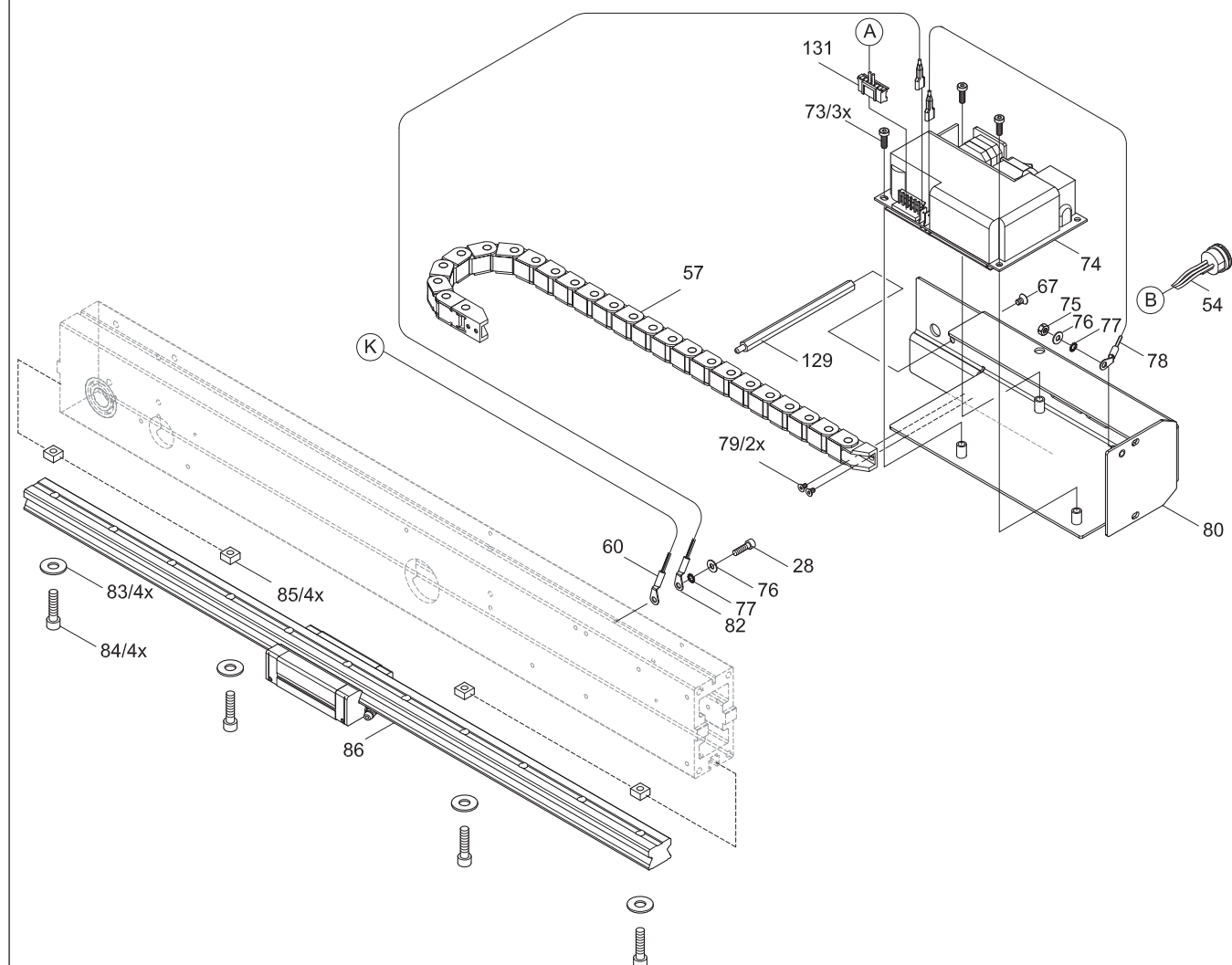




## 6.4 Power Supply

No	Part No.	Description	PU	Note	Serial No.	
					from	to
28	5902241.001	Screw DIN7984-M4x10	10			
54	8936896.001	Bushing	1			
57.1	8936846.001	Energy Track	1	a		
57.2	8936847.001	Energy Track	1	b		
60	8930981.001	Cable Grounding	1			
73	5902358.001	Screw DIN7984-M4x6	10			
74	5551126.001	Power Supply	1			
75	5902510.001	Nut DIN934-M4	10			
76	5903033.001	Washer DIN125-A4.3	10			
77	5903011.001	Toothed Washer DIN6797-A4.3	10			
78	5534176.001	Cable Grounding	1			
79	5902047.001	Screw DIN7991-M3x5	10			
80	8936850.001	Bracket Power Supply	1			
82	8936844.001	Ground Cable	1			
83	5903028.001	Washer DIN433-6.4	10			
84	5902178.001	Screw DIN912-M6x20	10			
85	5902525.001	Nut DIN557-M6	10			
86.1	5905183.001	Guide L=640	1	a		
86.2	5905347.001	Guide L=780	1	b		
131	8936805.001	Emergency Switch	1			

Note	a	450
	b	600



## 6.5 Carriage With Roller Blade

No	Part No.	Description	PU	Note	Serial No.	
					from	to
28	5902241.001	Screw DIN7984-M4x10	10			
45	5902245.001	Screw DIN933-M3x10	10			
46	5903004.001	Washer DIN125-A3.2	10			
57.1	8936846.001	Energy Track	1	a		
57.2	8936847.001	Energy Track	1	b		
79	5902047.001	Screw DIN7991-M3x5	10			
87	5902144.001	Screw DIN7984-M3x5	10			
88	8936869.001	Cover	1			
89	5902521.001	Nut DIN439-M3	10			
90	5902056.001	Screw DIN965-M3x8	10			
91	8930852.001	Bracket	1			
92	8936809.001	Sensor	1			
93	8930901.001	Plate	1			
94	8930810.001	Fixing	1			
95	8936824.001	Bracket	1			
96	8936946.001	Carriage	1			
97	5902010.001	Screw DIN912-M3x10	10			
98	8936808.001	Sensor	1			
99	8936890.001	Holder	1			
100	5900516.001	Spacer Bushing PA M3x5	10			
101	8936817.001	PCB Splitter	1			
102	5900073.001	Distance Bolt M3x14	10			
103	5904527.001	Set Screw DIN913 M4x30	10			
104.1	5902030.001	Screw DIN7991-M3x12	10			4504
104.2	5902010.001	Screw DIN912-M3x10	10		4505	

No	Part No.	Description	PU	Note	Serial No.	
					from	to
105.1	8931628.001	Set Knob	1			4504
105.2	8936943.001	Set Knob	1		4505	
106.1	8931627.001	Guide Washer	1			4504
106.2	8936945.001	Guide Washer	1		4505	
107.1	8931630.001	Plate	1			4504
107.2	8936944.001	Plate	1		4505	
108	8936841.001	Bushing	1			
110	8936615.001	Shield	1			
111	8936643.001	Eccentric Axle	1			
112	8936614.001	Shield	1			
113	8930590.001	Screw	1			
114	8936833.001	Guiding	1			
116	5903026.001	Washer DIN988-15x21x0.1	10			
117.1	8930509.001	Circular Blade	1			
118	8936886.001	Knurled Nut	1			
119	8936843.001	Motor Bracket	1			
120	5902137.001	Screw DIN912-M6x12	10			
121	5900061.001	Distance Bolt M4x25	10			
122	8936888.001	Distance Bolt	1			
123	8936778.001	Slipping Clutch	1			
124	8936914.001	Motor	1			
125	8936807.001	Cable	1			
132	8936953.001	Set Knob cpl.	1			

Note	a	450
	b	600

